Fac/Perm/Co ID #	Date	Doc ID#
9502	8/29/08	5737

Watauga County Sanitation
Recycling Office

Memo

To: Allen Gaither, NC DENR Permitting Office

From: Lisa Doty, Recycling Coordinator

CC: JV Potter

Date: August 26, 2008

Re: ASU Greenhouse/Algae Production Proposal at old Watauga County Landfill Site

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Attached is a proposal from ASU's Departments of Technology and Biology to build a prototype greenhouse at the old Watauga County Landfill Site and to conduct research on algae cultivation for biodiesel production. Both of these ongoing research projects are funded by the US Environmental Protection Agency. The attached proposal outlines the project and funding mechanisms.

Other relevant aspects of the project include:

- Location: Greenhouse would be built between the blower/flare station and the Forestry storage building. Sanitation Department will provide grading for site.
- Access: Greenhouse would be accessed by faculty and students during regular hours of operation. (Monday – Friday from 8:00 a.m. – 4:30 p.m. and Saturday from 8:00 a.m. – 12:00 p.m.)
- Electricity: There is an unused electrical meter box that previously provided service to the blower/flare station. ASU would be responsible for contacting Blue Ridge Electric to set up account on this meter and for monthly charges.
- Water: ASU will contact Town of Boone to tap into water line.

Please call me @828-265-4852 with any questions or for more information

Proposal:
Watauga Landfill Greenhouse Eco-Lab

Appalachian State University Departments of Technology and Biology

This proposal is from a partnership of two projects at Appalachian State University, both funded through the EPA P3 Sustainable Design Competition: The Affordable Bioshelters Project from the Department of Technology, and Closing the Carbon Loop: Growing Algae with Sustainable CO_2 from the Department of Biology. The two projects have funds in hand to respectively install a new kind of solar greenhouse developed through two years of award winning research, and conduct research on algae cultivation within the greenhouse using CO_2 from renewable sources.

We are proposing to install this greenhouse at the Watauga County landfill at a site near the flare that will provide both good solar resources and affordable access to public utilities as well as two small (6x10) passive solar research sheds to be used for research and equipment storage.

The Affordable Bioshelters Project is developing liquid foam insulated greenhouse kit for farmers. Two years of research have provided proof of concept and the project is now moving into product design. We would like to install the first prototype of the kit in the fall of 2008 and evaluate the ease of installation and look for and address any problems in its design and functioning, as well as monitor its energy efficiency. The majority of the space within the greenhouse will be used by the Algae Research Project, with about a quarter of the space reserved for projects by Technology Department graduate students who will help set up and maintain the lab.

The Algae Initiative will explore new methods for algae-culture from renewable CO2 in hybrid production systems by building an open pond and a closed "photobioreactor" for algae growth. Algae-culture has the potential to provide for large amounts of oil produced on small amounts of land for biodiesel production. Currently algae-culture systems are dependent on non-renewable sources of fossil fuels for the high levels of carbon dioxide necessary for rapid algae growth and face technical challenges to large scale production. We will use this facility to conduct experiments aimed at rectifying both of these issues by using renewable sources of CO_2 and developing new methods for algae growth. This will include modifying CO_2 inputs, nutrient source and levels and mixing/recirculation protocols.

We are looking forward to working with the Watauga County Commissioners and Landfill Staff as part of the continuing efforts to use the landfill as a community resource for regional, sustainable economic development. We believe that this effort will pay off by advancing alternative energy in Watauga County and in the State and to provide research opportunities for ASU students.

Sincerely,

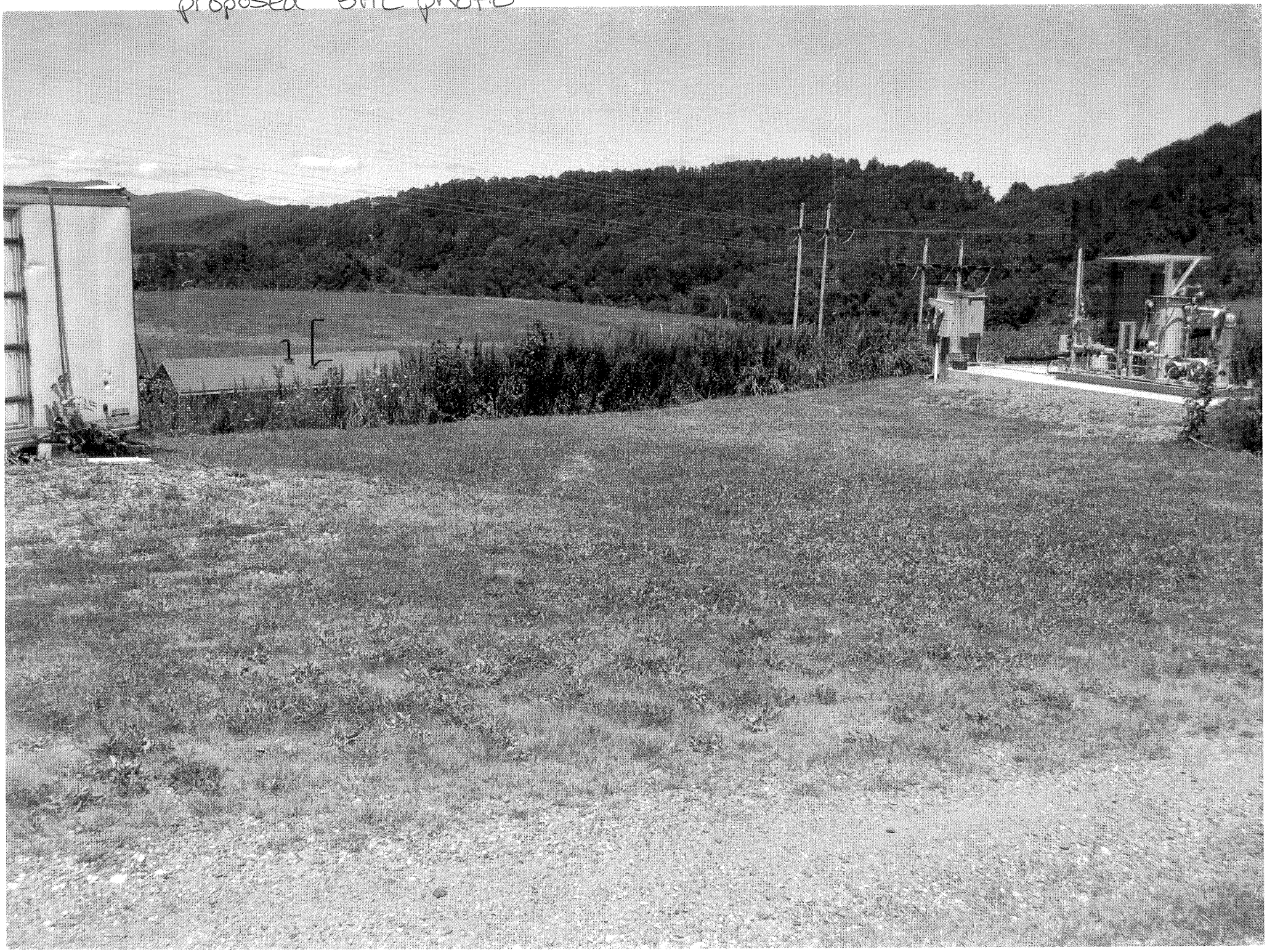
Dr. Brian Raichle,
Affordable Bioshelters Principal Investigator

Dr. Mark Venable
Algae Culture Principal Investigator

Yonitan Strauss
Affordable Bioshelters Graduate Student

Erica Porras
Algae Culture Graduate Student

proposed site photo




Animal Control
blocues/ flare
Greenhouse
forest service office
forest service storage trailer
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